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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,241	03/30/2004	Gabriel Loh	42P18222	8141

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EXAMINER

ALROBAYE, IDRIS N

ART UNIT	PAPER NUMBER
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2183

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/18/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/815,241

Applicant(s)

LOH, GABRIEL

Examiner

Idriss N. Alrobaye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is responsive to communications through the applicant's application filed on 03/30/2004.

Claims 1-21 are presented for examination

Specification

2. The specification is objected to because of the following informalities: paragraph [0018] stated "four intermediate branch history units", the intermediate branch history units are nowhere shown in the drawn. However, the examiner assumes that the "intermediate branch history units" is the "intermediate branch prediction units". Appropriate correction is required.

Claim Objections

3. Claim 7 is objected to because of the following informalities: the claim stated "intermediate branch history units", the intermediate branch history units are nowhere shown in the drawn (see objection for the spec above). For the purpose of prosecution the case, the examiner assumes that the intermediate branch history units are the intermediate branch prediction units. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7-11 are rejected under 35 U.S.C. 112, second paragraph. Claim 7 recites the limitation "first and second plurality of instructions". There is insufficient antecedent basis for this limitation in the specification. The only similar concept mentioned in the specification is "multiple instructions".

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 18-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per claims 18 and 20, the steps claimed in the method and the instructions in the medium do not produce any tangible results (i.e. do not produce any physical transformation of data) and hence non-statutory.

Claims 19 and 21 fail to resolve the deficiencies of claims 18 and 20. Claims 19 and 21 do not produce any tangible results and thus non-statutory.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Baweja et al. U.S. Patent No. 6,332,189 (hereinafter Baweja).

As per claim 1, Baweja teaches an apparatus comprising:

storage means for storing a first type of branch history information (see e.g. Fig. 1b-1c, wherein element 122 (Fig. 1b) and element 132 (Fig. 1c) are the storage means. Also, see e.g. Fig. 2, wherein element 220 is (Fig. 1b) and element 230 (Fig. 1c), see col. 4, lines 51-67 to col. 5, lines 1-51);

intermediate prediction means (see e.g. Fig. 2, elements 210, 220 and 230) for generating a plurality of intermediate branch prediction results based off of a plurality of portions of the store branch history information (elements 210, 220 and 230 generates a plurality of intermediate branch prediction based off the store branch history information. See e.g. col. 4, lines 12-18 and col. 5, lines 1-51), wherein the intermediate prediction means uses a portion of the branch history information that is smaller than all of the branch history information stored within the storage means in order to generate the plurality of intermediate branch prediction results (see e.g. Fig. 2, wherein as long as all the branch history information are not been used for the final result, then it's smaller all of the branch history information stored within the storage means; see also, col. 4, lines 51-67 to col. 5, lines 1-51);

final prediction means for generating a final branch prediction result based off of the plurality of intermediate branch prediction results (see e.g. Fig. 2, wherein the output

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of the multiplexer element 250 generates the final branch prediction; see also col. 5, lines 21-43).

As per claim 2, Baweja teaches the invention as claimed above. Baweja further teaches the apparatus of claim 1 wherein the storage means is a register within a microprocessor (see e.g. Fig. 1c, element 132).

As per claim 3, Baweja teaches the invention as claimed above. Baweja further teaches the apparatus of claim 1 wherein the storage means is a memory location within a computer system (see e.g. Fig. 1b, element 122).

As per claim 4, Baweja teaches the invention as claimed above. Baweja further teaches the apparatus of claim 1 wherein the intermediate prediction means comprises a plurality of intermediate branch predictors to perform a plurality of intermediate branch predictions in parallel (see e.g. Fig. 2, wherein elements 220 and 230 are in parallel).

As per claim 5, Baweja teaches the invention as claimed above. Baweja further teaches the apparatus of claim 1 wherein the final prediction means is a single branch predictor (see e.g. Fig. 2, elements 240 and 250 outputs a final prediction).

As per claim 6, Baweja teaches the invention as claimed above. Baweja further teaches the apparatus of claim 1 wherein the intermediate branch prediction means

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comprises a first plurality of intermediate branch prediction units to perform a plurality of branch predictions in parallel, and a second plurality of intermediate branch prediction units to perform a plurality of branch predictions in series with the first plurality of intermediate branch prediction units (see e.g. Fig. 2, and col. 4, lines 60-67).

As per claim 7, Baweja teaches a computer system comprising:

a memory unit to store a first and second plurality of instructions (see e.g. abstract; col. 1, lines 15-19, lines 60-67; col. 6, lines 40-46);

a processor to predict whether to execute the first or the second plurality of instructions (see e.g. abstract and Fig. 2) based, at least in part, on an intermediate branch prediction to be made by a plurality of intermediate branch prediction units (see e.g. Fig. 2, wherein elements 220, 230 and 210 are the intermediate branch prediction units), the intermediate branch history units each corresponding to a different portion of a set of branch history information, each different portion being smaller than the set of branch history information (each branch prediction unit have branch history information, see the rejection for claim 1; same reasoning for rejection applied for this claim).

As per claim 8, Baweja teaches the invention as claimed above. Baweja further teaches the computer system of claim 7 wherein the processor comprises a final branch prediction unit to perform a final branch prediction based on predictions of the intermediate branch prediction units (see e.g. Fig. 2, wherein the output of the

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multiplexer element 250 generates the final branch prediction; see also col. 5, lines 21-43).

As per claim 9, Baweja teaches the invention as claimed above. Baweja further teaches the computer system of claim 8 further comprising a branch history storage unit to store the set of branch history information (see e.g. Fig. 1b-1c, wherein element 122 (Fig. 1b) and element 132 (Fig. 1c) are the storage means. Also, see e.g. Fig. 2, wherein element 220 is (Fig. 1b) and element 230 (Fig. 1c)).

As per claim 10, Baweja teaches the invention as claimed above. Baweja further teaches the computer system of claim 9 wherein the branch history storage unit is a memory location (see e.g. Fig. 1b, element 122).

As per claim 11, Baweja teaches the invention as claimed above. Baweja further teaches the computer system of claim 9 wherein the branch history storage unit is a register within the processor (see e.g. Fig. 1c, element 132).

Claims 12-17 are rejected on grounds corresponding to the reasons given above for claims 1-6.

As per claim 18, Baweja teaches a method comprising:

accessing a plurality of branch prediction segments in parallel (see e.g. Fig. 1b-1c, wherein element 122 (Fig. 1b) and element 132 (Fig. 1c) are the segments; Also, see e.g. Fig. 2, wherein element 220 is (Fig. 1b) and element 230 is (Fig. 1c); see e.g. col. 4, lines 51-67 to col. 5, lines 1-51, parallel);

performing a plurality of intermediate branch predictions based off of the plurality of branch prediction segments (see e.g. Fig. 2, elements 220 and 230), wherein each intermediate branch prediction is based off of a different branch prediction segment (see e.g. Fig. 1b-1c and Fig. 2, elements 220 and 230, wherein each branch prediction is based off of a different segment) and each branch prediction segment is smaller than the sum of the branch prediction segments (see e.g. Fig. 2, wherein as long as all the branch prediction segments are not been used, then it's smaller than the sum of the branch prediction segments; see also, col. 4, lines 51-67 to col. 5, lines 1-51).

As per claim 19, Baweja teaches the invention as claimed above. Baweja further teaches the method of claim 18 further comprising performing a final branch prediction based off of the plurality of intermediate branch predictions (see e.g. Fig. 2, wherein the output of the multiplexer element 250 generates the final branch prediction; see also col. 5, lines 21-43).

Claims 20-21 are rejected on grounds corresponding to the reasons given above for claims 18-19.

Conclusion

10. The following is text cited from 37 CFR 1.111(c): In amending reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Totsuka et al. U.S. Patent No. 6,640,298 shows local, global and choice branch predictions with global history register in common.
- Muthusamy U.S. Patent No. 6,108,774 shows branch predication storage that predicts multiple branches and contains a final prediction
- Zuraski, Jr. et al. U.S. Patent No. 6,502,188 shows dynamic classification of conditional branches in global history branch prediction
- Dutta et al. "Control flow prediction with Tree-Like subgraphs for superscalar processors" shows tree like predictors.
- See also PTO-892

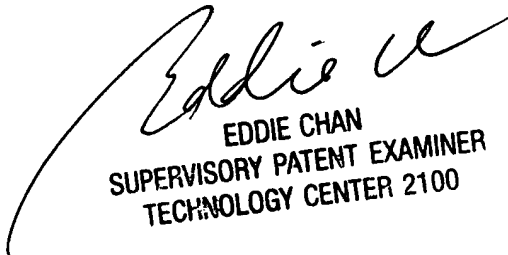
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Idriss N. Alrobaye whose telephone number is 571-270-1023. The examiner can normally be reached on Mon-Fri from 8:00 to 4:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 571-272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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